

AMENDMENTS TO THE CLAIMS

1-4. (Canceled)

5. (Previously presented) An apparatus for manufacturing a semiconductor device, comprising:

a substrate holding unit for holding a semiconductor wafer substrate, wherein said semiconductor wafer substrate is provided with at least one electrode formed on a first surface thereof;

a discharging mechanism for discharging droplets of raw sealant resin contained in a resin container unit through at least one discharging nozzle onto said first surface of said semiconductor wafer substrate held on said substrate holding unit;

a drive mechanism for displacing at least one of said semiconductor wafer substrate and said discharging nozzle;

a control unit for controlling said discharging mechanism and said drive mechanism such that said raw sealant resin is attached to said first surface of said semiconductor wafer substrate excluding at least a portion of said electrode;

an image information device for capturing image information of said semiconductor wafer substrate prior to said raw sealant resin being discharged from said discharging mechanism, said image information device configured to provide said image information to said control unit; and

at least two kinds of discharging mechanisms, each being capable of discharging respective different amounts of raw sealant resin,

wherein said control unit is constructed to calculate a position based on said image information for said drive mechanism to displace said at least one of said semiconductor wafer substrate and said discharging nozzle, and for said discharging mechanism to discharge said droplets of raw sealant resin on said first surface of said semiconductor wafer substrate excluding said at least a portion of said electrode.

6-8. (Canceled)

9. (Original) The apparatus for manufacturing a semiconductor device according to claim 5, wherein said control unit controls said discharging mechanism and said drive mechanism such that a first discharging mechanism of said at least two kinds of discharging mechanisms is capable of discharging droplets of raw sealant resin of an amount smaller than other discharging mechanisms used for discharging said raw sealant resin for an area in a vicinity of said electrode.

10-26. (Canceled)

27. (Currently amended) An apparatus for manufacturing a semiconductor device, comprising:

substrate holding means for holding a semiconductor wafer substrate, wherein said substrate is provided with at least one electrode formed on a first surface thereof;

means for discharging droplets of raw sealant resin contained in a resin container unit through at least one discharging nozzle onto said first surface of said semiconductor wafer substrate held on said substrate holding unit;

drive means for displacing at least one of said semiconductor wafer substrate and said discharging nozzle;

means for controlling a discharging mechanism and a drive mechanism, said controlling means being constructed to control said discharging mechanism and drive mechanism such that said raw sealant resin is attached to said first surface of said semiconductor wafer substrate excluding at least a portion of said electrode;

means for capturing image information of said semiconductor wafer substrate prior to droplets of raw sealant resin being discharged by said discharging means;

means for providing image information of said semiconductor wafer substrate;

means for calculating a position, based upon said image information, for said discharging mechanism to discharge said droplets of raw sealant resin on said first surface of said semiconductor wafer substrate excluding at least a portion of said electrode, and for said drive mechanism to displace at least one of said semiconductor wafer substrate and said discharging nozzle; and

at least two kinds of means for discharging, each said discharging means being capable of discharging raw sealant resin in an amount different from the other.

28-30. (Canceled)

31. (Currently amended) An apparatus for manufacturing a semiconductor device, comprising:

substrate holding means for holding a semiconductor wafer substrate, wherein said substrate is provided with at least one electrode formed on a first surface thereof;

means for discharging droplets of raw sealant resin contained in a resin container unit through at least one discharging nozzle onto said first surface of said semiconductor wafer substrate held on said substrate holding unit;

drive means for displacing at least one of said semiconductor wafer substrate and said discharging nozzle;

means for controlling a discharging mechanism and a drive mechanism, said controlling means being constructed to control said discharging mechanism and drive mechanism such that said raw sealant resin is attached to said first surface of said semiconductor wafer substrate excluding at least a portion of said electrode;

means for capturing image information of said semiconductor wafer substrate prior to droplets of raw sealant resin being discharged by said discharging means;

means for providing image information of said semiconductor wafer substrate; and

means for calculating a position, based upon said image information, for said discharging mechanism to discharge said droplets of raw sealant resin on said first surface of said semiconductor wafer substrate excluding at least a portion of said electrode, and for said drive mechanism to displace at least one of said semiconductor wafer substrate and said discharging nozzle,

wherein said means for controlling controls said means for discharging and said drive means such that a first means for discharging, of at least two kinds of means for discharging, is capable of discharging droplets of raw sealant resin of an amount smaller than other means for discharging and said first means for discharging is used for discharging said raw sealant resin for an area in vicinity of said electrode.

32-35. (Canceled)

36. (Currently amended) A semiconductor device manufacturing apparatus, comprising:

a semiconductor wafer substrate, said semiconductor wafer substrate having at least one electrode on a first surface thereof, and wherein said semiconductor wafer substrate is held in a substrate holding unit;

at least one discharging head for discharging droplets of raw sealant resin on said semiconductor wafer substrate and having at least one discharging nozzle;

a resin container unit connected to said discharging head and containing raw sealant resin;

a drive mechanism for displacing at least one of said semiconductor wafer substrate and said discharging head;

an image information camera for capturing image information of said semiconductor wafer substrate prior to said raw sealant resin being discharged by said discharging head, said image information device configured to provide said image information of said semiconductor wafer substrate; and

a control unit for controlling said discharging head and said drive mechanism,

wherein said control unit is ~~constructed~~ adapted to calculate a position, based on said image information, for said discharging head to discharge droplets of raw sealant resin on said semiconductor wafer substrate excluding said at least one electrode, and for said drive mechanism to displace said at least one of said semiconductor wafer substrate,

wherein said at least one electrode has a protruded-shape, and

wherein said control unit controls said discharging head and said drive mechanism such that said first surface of the semiconductor wafer substrate is covered by said raw sealant resin except for a tip portion of said protruded-shaped electrode.

37-38. (Canceled)

39. (Previously presented) A semiconductor device manufacturing apparatus, comprising:

a semiconductor wafer substrate, said semiconductor wafer substrate having at least one electrode on a first surface thereof, and wherein said semiconductor wafer substrate is held in a substrate holding unit;

at least one discharging head for discharging droplets of raw sealant resin on said semiconductor wafer substrate and having at least one discharging nozzle;

a resin container unit connected to said discharging head and containing raw sealant resin;

a drive mechanism for displacing at least one of said semiconductor wafer substrate and said discharging head;

an image information camera for capturing image information of said semiconductor wafer substrate prior to said raw sealant resin being discharged by said discharging head; said image information device configured to provide said image information of said semiconductor wafer substrate; and

a control unit for controlling said discharging head and said drive mechanism,

wherein said control unit is constructed ~~adapted~~ to calculate a position, based on said image information, for said discharging head to discharge droplets of raw sealant resin on said semiconductor wafer substrate excluding said at least one electrode, and for said drive mechanism to displace said at least one of said semiconductor wafer substrate, and

wherein said discharging head further comprises at least two kinds of discharging mechanisms, each being capable of discharging respective different amounts of raw sealant resin.

40. (Currently amended) A semiconductor device manufacturing apparatus, comprising:

a semiconductor wafer substrate, said semiconductor wafer substrate having at least one electrode on a first surface thereof, and wherein said semiconductor wafer substrate is held in a substrate holding unit;

at least one discharging head for discharging droplets of raw sealant resin on said semiconductor wafer substrate and having at least one discharging nozzle;

a resin container unit connected to said discharging head and containing raw sealant resin;

a drive mechanism for displacing at least one of said semiconductor wafer substrate and said discharging head;

an image information camera for capturing image information of said semiconductor wafer substrate prior to said raw sealant resin being discharged by said discharging head, said image information device configured to provide said image information of said semiconductor wafer substrate; and

a control unit for controlling said discharging head and said drive mechanism,

wherein said control unit is constructed ~~adapted~~ to calculate a position, based on said image information, for said discharging head to discharge droplets of raw sealant resin on said semiconductor wafer substrate excluding said at least one electrode, and for said drive mechanism to displace said at least one of said semiconductor wafer substrate, and

wherein said resin container unit further comprises a heater for heating said raw sealant resin contained in said resin container unit.

41. (Previously presented) An apparatus for manufacturing a semiconductor device, comprising:

a substrate holding unit for holding a semiconductor wafer substrate, wherein said semiconductor wafer substrate is provided with at least one electrode formed on a first surface thereof;

a discharging mechanism for discharging droplets of raw sealant resin contained in a resin container unit through at least one discharging nozzle onto said first surface of said semiconductor wafer substrate held on said substrate holding unit;

a drive mechanism for displacing at least one of said semiconductor wafer substrate and said discharging nozzle;

a control unit for controlling said discharging mechanism and said drive mechanism such that said raw sealant resin is attached to said first surface of said semiconductor wafer substrate excluding at least a portion of said electrode; and

an image information device for capturing image information of said semiconductor wafer substrate prior to said raw sealant resin being discharged from said discharging

mechanism; said image information device configured to provide said image information to said control unit,

wherein said control unit is constructed to calculate a position based on said image information for said drive mechanism to displace said at least one of said semiconductor wafer substrate and said discharging nozzle, and for said discharging mechanism to discharge said droplets of raw sealant resin on said first surface of said semiconductor wafer substrate excluding said at least a portion of said electrode, and

wherein a sealant resin layer having an uneven surface structure is formed from the raw sealant resin.

42. (Previously presented) The apparatus of claim 42, wherein the uneven surface structure comprises a concave structure.

43. (Previously presented) The apparatus of claim 42, wherein the uneven surface structure comprises a predetermined shape.

44. (Previously presented) The apparatus of claim 42, wherein the uneven surface structure comprises a thickness of approximately 15 μm , having concave portions of approximately 20 μm deep.